

Volume 35 — January to December 1990

4

# nuclear engineering

INTERNATIONAL

## *Index*

U.I.C.  
FEB 24 1991  
LIBRARY

Volume 35  
January to December 1990



Digitized by the Internet Archive  
in 2023



# Volume 35 — January to December 1989

**NOTES:** Index references give the month and page numbers: thus "Nov 12" means page 12 of the November issue. Items on individual nuclear power stations are listed under the station name, not by country. The contents of the *World Nuclear Industry Handbook* and other special supplements are not included.

## A

**ABB Atom:** Bid for CE, Jan 1; Fuel for Isar and Brunsbüttel, Mar 15; Options reviewed, Jul 10; Westinghouse co-operation ends, Aug 12; Innovative Technologies, Aug 12; Vessel inspection, Sep 5; Mühleberg venting, Sep 6; Future markets and technologies, Oct 45; *See also* ABB-CE

**ABB-CE:** System 80 Plus™ certification, Oct 63; President, Dec 8

**Accidents:** Bohunice A-1, Apr 7; Kyshtym, Nov 26

**Advanced gas-cooled reactors:** *See* Gas-cooled reactors

**Advanced light water reactors:** *See* Boiling water reactors or Pressurized water reactors

**AEA Technology:** Rebirth, Jan 14; Neutron measurement, Feb 45; Sites to be licensed, Feb 16; NEATER robot, May 26; DIDO, May 4, Jul 8; Windscale decommissioning, Jun 48; Job cuts, Jul 8; PLUTO, Jul 8; GLEEP, Oct 11; 3D TV, Nov 44; EFR model, Dec 8

**Angra:** 1 restarted, Mar 7, O&M, Oct 110; 2 investment, Mar 7; 3 shelved?, Sep 5; 2 and 3 work stopped, Oct 18

**Aktash:** Halted, Jan 8

**Algeria:** *See* World Survey, Jun 28

**Argentina:** Nuclear plans, Sep 4; O&M experience, Oct 108; CAREM, Dec 8; *See also* World Survey, Jun 21

**Armenia:** Decommissioning, Oct 5

**Asea-Brown Boveri:** *See* ABB Atom

**ASSET missions:** *See* International Atomic Energy Agency

**Atucha:** 1, re-start, Jan 6, Feb 17; clearing debris, Jul 31; 2 finance, Jan 6

**Australia:** *See* World Survey, Jun 21

## B

**Babcock & Wilcox:** PROFIL-360, Jan 39; Calvert Cliffs valves, Apr 41; FARIS fuel repair, May 60; Shipping container, Aug 25; On-line chemistry, Aug 35; Future markets and technologies, Oct 46; Fuel Master, Dec 20

**Bangladesh:** Plans, May 7; *See also* World Survey, Jun 21

**Bashkir:** Cancelled, Nov 10

**Bechtel:** Valve performance, Apr 42

**Belene:** Construction stopped, Jul 5

**Belgium:** Utilities merge, Apr 3; Pakistan, Aug 4; *See also* World Survey, Jun 21

**Beznau:** I&C upgrading, Apr 28; SG replacement, Nov 6

**Biblis:** B risk study, Mar 17

**Boiling water reactors:** On-screen design, Jul 53; NRC ABWR certification, Aug 7; Vessel inspections, Sep 5; Inspecting in-core housings, Nov 42; GE weld inspection, Dec 41

**Bohunice:** A-1 accidents, Apr 7; V-1 opposition, Sep 10; A-1 decommissioning, Sep 28; V-1 and 2 safety contract, Oct 5

**Brazil:** FRG agreement, Feb 7; Soviet agreement, Feb 10; Datafile, Apr 47; Policy rethink, Jun 11, Jul 3, Oct 18; O&M experience, Oct 108; *See also* World Survey, Jun 21

**British Nuclear Fuels (BNFL):** Reprocessing prospects, Jan 10; US subsidiary, Jan 11; New reactors, Feb 7; Drigg charges, Feb 16; Vitrification, Mar 43; Leukaemia, Apr 2, Nov 7; International company, May 4; Sizewell B contract, May 4; MOX plant, May 4; German contracts, Jun 10, Oct 10; THORP, Dec 11

**Browns Ferry:** 2 defuelled, Feb 4

**Bruce:** 4 software error, Mar 2, Jun 14;

**Brunsbüttel:** ABB Atom fuel, Mar 15

**Brunswick:** 1 and 2, closed, Jul 7, restarted, Aug. 6

**Bulgaria:** Hard times, Oct 83; *See also* World Survey, Jun 21

## C

**Calder Hall:** Extra 10 years, Jun 10

**Calvert Cliffs:** Valve services, Apr 41; Restart, Jun 12

**Canada:** Ontario, energy plan, Feb 2, opposition, Dec 10; CANDU 3, Feb 2, Apr 31, May 22; AECL/GE Canada joint venture, Feb 3; Soviets study CHP reactors, Apr 6; OH prosecuted, May 12; Pakistan, Aug 4; Datafile, Aug 47; Candu decommissioning, Sep 22; Future markets and technologies, Oct 36, Oct 45; CANDU at crossroads, Nov 15; OH dose rates, Nov 50; Rabbit Lake, Dec 11; *See also* World Survey, Jun 21

**Cernavoda:** Progress, Feb 3; Benefits of openness, Jun 18; More Canadians, Jun 18

**Chashma:** Start date, Jan 7; Multi-unit site, Aug 4

**Chapel Cross:** Extra 10 years, Jun 10

**Chernobyl:** Deaths report, Jan 8; Evacuations, Mar 6; Opposition, Mar 6; Fire-fighting lessons, Apr 34; Costs, May 6; Swiss contract, May 6; IAEA, assessment, Jun 2, research centre, Nov 10; Soviet initiatives, Jun 2; Appeal for aid, Jun 3; Insider's notebook, Jun 50; 3 power loss, Oct 4; Closure vote, Oct 4; Sarcophagus, Oct 6, Nov 11; Conference, Dec 11

**Chile:** *See* World Survey, Jun 28

**China:** Programme progress, Mar 54; District heating reactor, Jun 15; Pakistan, Dec 46; *See also* World Survey, Jun 21

**Chinon:** A1 tourists, Oct 12

**Chooz:** B1 delay, Dec 7

**Cienfuegos:** Soviet aid, Mar 10

**Civaux:** 1 order, Aug 9

**Cofrentes:** OSART, Jul 4

**Comanche Peak:** 1 critical, Apr 4; Full power, Jun 12

**Combustion Engineering:** ABB bid, Jan 2; PIPES expert system, Jan 37; ABB review, Jul 10; *See also* ABB-CE

**Comecon:** Regulation, Jul 10; Survey, Oct 70; Links unravel, Oct 83; Small PWR performance, Nov 23

**Computer-aided design:** PHOENICS, Jul 52; On-screen updating, Jul 53

**Computers:** PIPES expert system, Jan 37; Loviisa, Jul 23; DATYS, Jul 57; IsoVu, Nov 54

**Connecticut Yankee:** *See* Haddam Neck

**Containment:** Peach Bottom vents, Jan 4; Soviet vent-filter tested, Feb 49; Pilgrim torus venting, Feb 58

**Control rods:** Earthquakes, Apr 26; PWR wear, May 48

**Corrosion:** In-vessel problems, Jan 43; Managing NDE data with CEMS, May 50; French turbines, Aug 37

**Costs:** UK figures, Jan 16a; US O&M, Mar 3, Nov 35

**Creys Malville:** Less plutonium, Jan 8; Sodium leak, Jul 5; Incident, Oct 10; Future, Dec 12

**Cuba:** India, Jul 7; *See also* World Survey, Jun 28

**Czechoslovakia:** Accidents, Apr 7; New plants, Jun 6, Jul 5, Jul 11; Simulators, Jul 48; India, Sep 9; Forum, Oct 5; Problems, Oct. 84; Look west, Dec 11; *See also* World Survey, Jun 21

## D

**Dampierre:** 1 SG replacement, Jan 29, May 3, Jul 8; Oct 124; 1 MOX, Dec 35

**Darlington:** 2, delay, May 11, full power, Aug 7

**Datafiles:** Finland, Jan 50; Brazil, Apr 47; Canada, Aug 47; Sweden, Oct 131; UK, Dec 48

**Decommissioning:** Pebble bed fuel plant, Mar 10; Rancho Seco, May 10; Windscale piles, Jun 48; THTR 300, Aug 10; Shippingport, Sep 20; Candu, Sep 22; New UK approach, Sep 25, Oct 10; Windscale AGR, Sep 26; Bohunice, Sep 28; Loviisa, Sep 33; Underwater arc (JPDR), Sep 35; Fort St Vrain, Sep 37;

**Decontamination:** Chernobyl, May 6; KWU two-step cleaning, Sep 49; CAN-DEREM, Sep 52; Strippable coatings, Sep 55; Armenia, Oct 5

**Diablo Canyon:** Radiation monitoring, Nov 52

**District heating:** Soviets study Canadian reactors, Apr 6; China, Jun 15; Gorky opposition, Jul 10; Pilsen, Sep 10

**Doel:** 3 SG contract, Feb 15, Nov 6; Power increase, May 58

**Dungeness:** A thermocouples, Oct 116

## E

**Electricité de France:** Leak-free PWR seals, Jan 48; Soviet Union, Feb 10; SG denting, Feb 15; Dose record, Feb 33; Safety report, Apr 3, May 16; Automated process instrumentation testing, Apr 21; Electropolishing, Aug 31; GDR share, Oct 10; Sand filters, Oct 10; Future markets and technologies, Oct 38; REP 2000, Oct 58; Maintenance under scrutiny, Nov 4; Refuelling regime, Dec 25; MOX, Dec 35; Moscow office, Dec 11

**Egypt:** Plans renewed, Aug 4 (correction Nov 10)

**Embalse:** O&M, Oct 110

**Emergency preparedness:** FRG, Feb 47

**Emsland:** BNFL contract, Jun 10

**Enrichment:** Rokkashomura, Feb 16; US DoE, budget, Mar 4, AVLIS, Apr 4, losses, Jun 13; Opportunities for suppliers, Jun 29; CRISLA, Oct 17; US buys Soviet SWUs, Dec 2; US one step licensing, Dec 3

**Environment:** Will nuclear thrive in greenhouse atmosphere? Nov 17

**European Economic Community:** Soviet agreement, Feb 10; Emission inspections, Jun 4; Energy market, Oct 26; East/West utilities, Nov 4

## F

**Fast reactors:** Kalpakkam, Jan 6; FFTF, closure, Mar 4, Dec 8, birthday, Jul 6; EFR, progress review, Aug 39, UK withdrawal, Sep 6, agreement, Nov 10, model, Dec 8; SNR-300, Aug 43; Loop-type for Japan, Sep 9; *See also* Creys Malville and Phénix

**Fessenheim:** 1 ten-year outage, Aug 45

**Filtration:** Crossflow, Feb 50; Sintered metal, Feb 52; Condensate filters, Feb 52; Metal fibre filters, Mar 55; Circular HEPA filters, Mar 56; Absorber material testing, Mar 57; *See also* Containment

**Finland:** Datafile, Jan 50; VVER design assessed, Apr 10; Fifth plant, Aug 3 (correction Nov 10); Future markets and technologies, Oct 37; *See also* World Survey, Jun 23

**Fire protection:** Suppression systems, Apr 30; CANDU 3, Apr 31; Tihange 1, Apr 32; Chernobyl lessons, Apr 34

**Fitzpatrick:** No cracks, Jul 6

**Fort St Vrain:** Decommissioning, Sep 37; conversion, Oct 16

**Framatome:** Doel 3 and Tihange 2, May 58; Hot spinning, Jul 3; Ownership, Aug 9; Future markets and technologies, Oct 46; *See also* Nuclear Power International

**France:** Framatome upgrades AFA, Mar 31; Hungary, May 6; Melox plant, Jul 5, Dec 33; Polish R&D, Jul 7; Iran loan, Aug 4; Pakistan, Aug 4, Oct 18; CEA strategy, Aug 9; Cogema contracts, Oct 10; Exports to Spain, Oct 10; Agreement with UK on ALWRs, Oct 12; SGN Fuel Master, Dec 20; *See also* World Survey, Jun 23

**Fuel:** Monju, Feb 16; Pebble bed plant decommissioned, Mar 10; Higher burnup, Mar 24; MOX industry, Mar 28, Dec 30; AFA upgraded, Mar 31; Vantage 5, Mar 36; Bangladesh, May 7; Repair with FARIS, May 60; Melox plant, Jul 5, Dec 32; Uranium market, Aug 18; US fabrication, Aug 19; Reducing maintenance, Aug 21; Fuel rod performance simulator, Aug 22; Longer cycles, Dec 25; Siemens MOX plant, Dec 33; *See also* Spent fuel

**Fuel handling systems:** AECL/GE Canada, Feb 3

**Fukushima:** II-3 manual flaw, May 7; New fuel, May 7; On-line, Nov 8

**Fusion:** LSX facility, Oct 4

**Future markets and technologies:** Utilities, Oct 36; Vendors, Oct 44



# G

**Gas-cooled reactors:** Magnox costs, Jan 16a; MHTGR, US study, Mar 3, safety, Sep 4, US DoE contract, Oct 17, feasibility, Oct 60, magnetic bearings, Oct 67, Power increase, Dec 10; AGRs, ADA, Apr 29, refuelling problems, Aug 10

**General Electric:** PRISM, Feb 4, May 12, Sep 4; SBWR agreement, Jun 14; Future markets and technologies, Oct 48; Inspection system, Dec 41; WPPSS, Dec 2

**Germany, DR:** VVERs shutdown, Apr 7; Looks to the west, May 2; Safety, Jul 10; Uncertain future, Jul 12; discussions with FRG utilities, Aug 9, Sep 6, Oct 10; Waste disposal with FRG, Sep 6; Handling waste, Sep 40; EdF, Oct 10; Unified industry, Oct 85; *See also* World Survey, Jun 23

**Germany, FR:** Brazil agreement, Feb 7; Wackersdorf, Feb 12; Radiation surveillance, Feb 47; Fuel plant decommissioned, Mar 10; Spent fuel disposal, Feb 12, Mar 10, Sep 38; Risk study, Mar 17; Plutonium store, Jul 8; Processing plant closure, Jul 8; GDR safety, Jul 10; Discussions with GDR utilities, Aug 9, Sep 6, Oct 10; Waste disposal with GDR, Sep 6; Unified industry, Oct 85; IAEA event scale, Nov 10; Repository opposition, Dec 7; *See also* World Survey, Jun 23

**Golfech:** 1 full power, Aug 9

**Gravelines:** 6 safety incident, Apr 3; 3 and 4 MOX, Dec 35

**Greifswald (Nord):** ASSET, Mar 6, Apr 7; 1 fire, Mar 6, Apr 7; 1 - 4 shutdown, Apr 7, May 2, Jul 12; OSART, Apr 7; Embrittlement, May 2, Jul 35; Lessons from incidents, Jun 42

**Guangdong:** Topped out, Jan 7; Reactor vessel, Apr 3; Progress report, Oct 25

**Gundremmingen:** Backfitting, Mar 10

# H

**Haddam Neck:** Cracks, Aug 6

**Heavy water:** India, Sep 9

**Heavy water reactor:** US DoE contract, Oct 17

**Hinkley Point C:** Planning permission, Oct 2

**Human factors:** Organizational issues, Mar 20; Organizational accident, Jul 18; Man-machine, Dec 18

**Hungary:** France, May 6; New plants, Jun 6; Future markets and technologies, Oct 38; Nuclear option reconsidered, Oct 86; *See also* World Survey, Jun 24

**Hunterston:** A shutdown, Mar 11

# I

**India:** Kalpakkam FBR, Jan 6; Secrecy criticized, Feb 16; Soviet deal problems, Mar 7; France, Mar 7; AEC chairman, Mar 10; Vietnam, Jul 7; Cuba, Jul 7; Sites, Jul 10; Heavy water plants, Sep 9; Czechoslovakia, Sep 9; Technology export, Oct 18; 500MWe units, Dec 8; *See also* World Survey, Jun 24

**Indian Point:** 2 uprating, May 10; 3 refuelling, Dec 10

**Indonesia:** Foreign agreements, Mar 52; Japan aid, May 6; Future markets and technologies, Oct 39; *See also* World Survey, Jun 24

**Inspection:** PIPES expert system, Jan 37; PROFIL-360, Jan 39; Japanese fibrescopes, Feb 62; Pump bowls, May 42, May 44; Mechanized wall thickness, May 54; Soviet SGs, Nov 39; InQual, Nov 41; BWR in-core housings, Nov 42; Sizewell B, components, Dec 42; *See also* Remote technology and Non-destructive testing

**Institute of Nuclear Power Operations (INPO):** Performance indicators, Jun 13

**Instrumentation and control:** EdF studies automated testing, Apr 21; Prairie Island, Apr 24; PWR control rods in earthquakes, Apr 26; Beznau upgrading, Apr 28; ADA for AGRs, Apr 29; Loviisa computers, Jul 23; Pressure transmitter safety margins, Jul 26

**International Atomic Energy Agency (IAEA):** Chernobyl, Jan 8, Jun 2, Nov 10; Greifswald ASSET, Mar 6;

New plants, Mar 12; OSART, programme, May 18, Coferentes, Jul 4, Kozloduy, Dec 6; Event scale, Jun 4, Nov 10; NPT review, Aug 16, Dec 16; Waste dumping code, Oct 6; PRIS, Oct 99; safety of older reactors, Nov 11

**Iran:** U processing plant, Mar 3; Soviet aid, May 7; French loan, Aug 4; *See also* World Survey, Jun 24

**Iraq:** *See* World Survey, Jun 28

**Isar:** 1 ABB Atom fuel, Mar 15

**Israel:** *See* World Survey, Jun 24

**Italy:** *See* World Survey, Jun 24

# J

**Japan:** Kansai, laser sleeving, Jan 35, degradation, Jul 40; BWR dose rates, Feb 31; Fibrescopes, Feb 62; Plutonium transport, Mar 7; Energy policy, Mar 53; Seismic testing, Apr 10; Waste plans, May 6; Doubling capacity, Jul 2; FBR design, Sep 9; Pakistan, Sep 10; Future markets and technologies, Oct 40, Oct 52; PWR scram rates, Oct 102; Passive PWR, Nov 8; Underwater vehicle, Dec 40; Qinshan, Dec 4; *See also* World Survey, Jun 24

**José Cabrera:** Life extension, Feb 56

**JPDR:** Decommissioning, Sep 35

**Juragua:** 1 and 2 delayed, Jun 12

# K

**Kaiga:** Calandria, Jul 7

**Kanupp:** Performance, Oct 20

**Kenya:** Uranium, Jan 4

**Khmelnitsky:** Halted, Oct 4

**Koodankulam:** Price problems, Mar 7

**Korea, North:** Plans delayed, Feb 16

**Korea, South:** Development plan, Jan 7; Standardization, Mar 51, Oct 2; Soviet uranium, Aug 4; *See also* World Survey, Jun 25

**Kozloduy:** Incident, Dec 6; OSART, Dec 6

**Kraftwerk Union:** *See* Siemens

**Kakrapur:** Pumps, Feb 16

# L

**Laguna Verde:** O&M, Oct 108

**Le Blayais:** 1 to 3 derated, Jul 10

**Life extension:** *see* Upgrading and refurbishment

**Limerick:** 1 and 2 full power, Feb 4; 2 commercial operation, Mar 3; PIMS, Jun 17

**Leukaemia:** Sellafeld study, Apr 2, May 4; La Hague, May 4

**Load factors:** Analysis by vendor, Jul 20; PRIS, Oct 99; *See also* Nuclear station achievement

**Loviisa:** Pipe rupture, Jul 4; Computers, Jul 23; Decommissioning, Sep 33

# M

**Maintenance:** NRC rule deferred, Feb 4; VITALS for MOVs, Apr 40; CATROB, May 38; Fuel, Aug 21; Fessenheim 1, Aug 45; Latin American experience, Oct 108; NOMIS review, Oct 111; Dungeness A/Oldbury thermocouples, Oct 116; Robots benefit PSE&G, Oct 120; Seismic scaffolding, Oct 121; EdF under scrutiny, Nov 4; *See also* Remote technology and Non-destructive testing

**Magnetic bearings:** MHTGR, Oct 67

**Manipulators:** *see* Remote technology

**Mapps:** 1 and 2 performance, Feb 16; Heavy-water leaks, Feb 60

**Materials degradation:** In-vessel problems, Jan 43

**Mergers and joint ventures:** Tables, Jan 2

**Mexico:** O&M experience, Oct 108; *See also* World Survey, Jun 25

**Midland:** Gas fired, Jul 7

**Millstone:** 2 SGs, Jan 41, Oct 16

**Mochovoce:** Start-up, Jan 8; I&C contract, Nov 3

**Monju:** Fuel, Feb 16

**Morocco:** Triga, Sep 9; *See also* World Survey, Jun 28

**Mühleberg:** Venting, Sep 6

# N

**Netherlands:** *See* World Survey, Jun 25

**Nine Mile Point:** 1 fuel loaded, Mar 3; 1 restarted, Sep 10

**Non-destructive testing:** Pump bowls, May 42, May 44; Detecting PWSCC in SGs, May 46; PWR control-rod wear, May 48; Data management with CEMS, May 50; Wall thickness inspection, May 54; Post-Smirt perspective, May 56; Glasgow conference, May 56; Guide tubes robot, May 56; SG leaks, May 57; Rees presents better image, May 57; SG tubes, May 57; ALOK for CRD housings, May 57; Hall effect current transducer, May 57; UK techniques for Soviets, May 57

**Narora:** 2 on-line, Dec 8

**Nord (Greifswald):** 5 shut-down, Feb 7

**North Korea:** Reprocessing, Sep 10

**Nuclear Energy Agency (NEA):** *See* Organization for Economic Co-operation and Development

**Nuclear Power International (NPI):** Soviet PWRs, Feb 10; One year on, Oct 56; Common product, Oct 56, Nov 4

**Nuclear Station Achievement,** Feb, 21, Apr 12 (correction, Jun 11), Sep 17; (*See also* Load factors)

# O

**Oldbury:** Thermocouples, Oct 116

**Olkiluoto:** CRDs, Mar 10

**Operation:** Latin America, Oct 105; Soviet shutdowns, Nov 21; Small Comecon PWRs, Nov 23; Experience feedback, Nov 33; Regulation and O&M costs, Nov 35; US outage times, Nov 36; *See also* Load factors

**Organization des Producteurs d'Energie Nucléaire (OPEN):** Fuel burnup, Mar 24

**Organization for Economic Co-operation and Development (OECD):** Dose reduction, Feb 44; LOFT, Oct 127; IRS, Nov 33

**OSART missions:** *See* International Atomic Energy Authority

**Oskarshamn:** Cracks, Dec 7

**Oyster Creek:** Exposure reduction, Nov 46

# P

**Pakistan:** Research reactors, Jan 6, Oct 20, Dec 45, Dec 46; U mine, Mar 10, May 6; Soviet reactor, May 7; French reactor, Aug 4, Oct 18; Belgian sales effort, Aug 4; Canada refuses technology, Aug 4; Japan, Sep 10; Nuclear Society, Oct 4; PAEC chairman, Oct 2; China, Dec 46; US aid, Dec 4; *See also* World Survey, Jun 25

**Paks:** Embrittlement, Jul 36 (correction, Aug 6)

**Palisades:** SG replacement, Apr 19; Westinghouse share, Sep 2

**Palo Verde:** 1 full power testing, Mar 54; 2 55% complete, Mar 54

**Paluel:** 2 to 4 SG inspection, May 6

**Peach Bottom:** 3 restart, Jan 4; 2 and 3, containment vents, Jan 4, full power, Feb 4; Utility reborn, Feb 21; PIMS, Jun 17

**Philippines:** Nuclear reconsidered, Aug 3

**Phénix:** Restart, Feb 15; Shutdown, Nov 46

**Pickering:** Hanger replacement, May 32

**Pilgrim:** Cancer link, Dec 2

**Piping:** DATYS, Jul 57

**PIUS:** ABB review, Jul 10

**Plutonium:** Transport to Japan, Mar 7; FRG store, Jul 8; *For* MOX *see* Fuel

**Poland:** Western investment, Jun 6; France, Jul 7; Analysis and decision time, Oct 87, Nov 3; *See also*



World Survey, Jun 26

**Prairie Island:** SG instrumentation, Apr 24; Dry storage, May 15

**Pressurized water reactors:** UK costs, Jan 16a; Leak-free vessel seals in France, Jan 48; Pump bowls, May 42, May 44; Control rods, May 48; Soviet safety, Jul 10; French vibration wear, Jul 28; Embrittlement in Soviet, Jul 33 (correction, Aug 6); Paks embrittlement, Jul 36 (correction, Aug 6); Glass model, Jul 44; NRC advanced designs certification, Aug 7, Oct 16; Optimum pH, Aug 28; French turbine corrosion, Aug 37; AP600 safety, Sep 4; Swedish vessel inspections, Sep 5; French sand filters, Oct 10; Anglo-French agreement on ALWRs, Oct 12; Westinghouse MoUs, Oct 16; Japan vessel inspection, Oct 20; NPI common product, Oct 56, Nov 4; REP 2000, Oct 58; System 80™ Plus certification, Oct 63; Soviet PWRs, Oct 75; Occupational exposure, Oct 95; Japan scram rates, Oct 102; Mitsubishi's passive, Nov 8; Small Comecon PWRs, Nov 23; US outage times, Nov 36; Tramp uranium, Nov 48; French MOX, Dec 35

**PRISM:** NRC, Feb 4; Containment, May 12; UCS doubts, Sep 4

**Pumps:** Vibration monitoring, Apr 44; UK test rig, Apr 45; Fukushima II-3 report, May 7; Bowls, May 42, May 44; *See also* Business to Business

## Q

**Quad Cities:** Crack, Jun 12

**Qinshan:** Delay, Jan 7; Commissioning, Aug 3; Japan to aid startup, Dec 4

## R

**Radiation:** US risk level raised, Feb 4; Dose reduction, Feb 17; Water chemistry revolution, Feb 27; Japanese reduce BWR dose rates, Feb 31; Dose record at French PWRs, Feb 33; Gundremmingen dose rates, Feb 37; Protective clothing and hot particle control, Feb 38; Growing interest in hot particles, Feb 41; ALARA monitored in US, Feb 42; OECD's ISOE, Feb 44; Neutron measurement, Feb 45; Surveillance in FRG, Feb 47; UK dose rates, Mar 10; Hot particles, Apr 46; EC emission inspections, Jun 4; ICRP recommends cut, Aug 6; PWR dose rates, Oct 95; Soviet dose rates, Nov 21; Employee attitudes to exposure reduction, Nov 46; Tramp uranium, Nov 48; Ontario Hydro dose rates, Nov 50; PG&E radiation monitoring, Nov 52; UK dose histories, Nov 53

**Rancho Seco:** Decommissioning, May 10

**Remote technology:** NEATER robot, May 26; Pickering hangers, May 32; SIMON, May 34; CATROB, May 38; Guide tubes robot, May 56; Dungeness A and Oldbury thermocouples, Oct 116; Robots benefit PSE&G, Oct 120; Gibbon, Nov 39; 3D TV, Nov 44; Ultrasonic vehicle, Dec 40; *See also* Inspection and Maintenance

**Reprocessing:** UP3 on line, Jan 8; BNFL prospects, Jan 10; Wackersdorf licence halted, Feb 12; North Korea, Sep 10; German contracts, Jun 10, Oct 10; Nuclear Electric's options, Oct 11; THORP, Dec 11

**Research reactors:** Pakistan, Jan 6, Oct 20; Kamini (India) critical, Feb 16; French high-flux closed, Mar 10; DIDO May 4, Jul 8; HIFAR, May 4; PLUTO, Jul 8; Morocco, Sep 9; GLEEP, Oct 11; RERTR, Dec 43; VVR-SM, Dec 44; PARR-1, Dec 45; PARR-2, Dec 46; Sizewell dissolver, Dec 37

**Ringhals:** 2 SG replacement, Jan 20, Jan 24, Jan 29, uprated, Jun 10

**Risk:** German study, Mar 17

**Robinson, HB:** On-line, Feb 7

**Robots:** *See* Remote technology

**Romania:** New spirit, Oct 87; *See also* World Survey, Jun 26

**Rostov:** Halted, Oct 4, Nov 10

**Rovno:** Halted, Oct 4

## S

**St Laurent-des-Eaux:** B1 and B2 MOX, Dec 35

**Safety:** EdF report, Apr 3, May 16; Soviet scram statistics, Apr 6; US plant examinations, Jun 37; PRA and common-mode, Jun 38; Safety blackout, Jun 41; Lessons from Greifswald, Jun 42; From ERGs to BERGs, Jun 44; Advanced designs questioned, Sep 4; Seismic scaffolding, Oct 121; LOFT, Oct 127; IAEA event scale in Germany, Nov 10; Older reactors, Nov 11; Operating experience feedback, Nov 33

**Santa Maria de Garoña:** Life extension, Feb 56

**Seabrook:** Full-power licence, Jan 4, Apr 4; On line, Jul 7; Commercial operation, Oct 16

**Seals:** Leaks in bolted joints, Jan 46; Leak-free vessel, Jan 48

**Security:** US tactical response training, Jun 52; EyeIdentify, Jun 54

**SGHWR:** Closure, Jul 8, Nov 6

**Shoreham:** Conversion, Feb 7

**Shippingport:** Decommissioning, Sep 20

**Siemens:** Control systems for Soviet PWRs, Jan 8; Ringhals SGs, Jan 24; Doel 3 SGs, Feb 15, Nov 6; Valve performance, Apr 42; SG chemical cleaning, Aug 33; Storage rack, Sep 44; Tihange SG cleaning, Sep 49; Bohunice contract, Oct 5; Future markets and technologies, Oct 52; Mochovce contract, Nov 3; Beznau SGs, Nov 6; Trillo, Nov 13; MOX plant, Dec 33; *See also* Nuclear Power International

**Simulation:** Ageing, Jul 43; STRATEG glass model, Jul 44; Helping instructors, Jul 46; Czechoslovakia, Jul 48; TREAT, Jul 50; Fuel rod performance, Aug 22

**Sizewell B:** Schedule, Mar 11; Cooling system, May 4; Containment, May 15; Test rig, May 15; PV cladding, May 15; Pump bowl inspections, May 44; Air handling, Jul 16; Pipe bridges, Jul 16; Costs, Aug 10, Sep 16; Component inspection, Dec 42

**Smolensk:** 3 start-up, Apr 6; Fire, Oct 4

**Software:** *see* Computers

**South Africa:** *See* World Survey, Jun 26

**South Ukraine:** Halted, Oct 4

**Soviet Union:** Siemens control systems, Jan 8; NPI, Feb 10; EdF, Feb 10, Dec 11; Brazil, Feb 10; EEC agreement, Feb 10; CYBER order, Feb 10; Waste, Mar 48; Scram statistics, Apr 6; Canadian CHP reactors, Apr 6; VVER-1000 assessed by IVO, Apr 10; US DoE safety plan, May 6; Pakistan, May 7; Iran, May 7; RMBKs, prospects, Jun 33; derating contested, Oct 6; Gorky opposition, Jul 10, Oct 4; V-230 safety, Jul 10; PWR embrittlement, Jul 33; VVER 440s in operation or under construction, Jul 35; Nuclear Society conference, Aug 2, Nov 21; Uranium for Korea, Aug 4; Construction halted, Oct 4; Opposition, Oct 4; Survey, Oct 70; Industry fights for survival, Oct 70; Simulation venture with USA, Oct 92; US waste agreement, Nov 10; Prepares to roll up sleeves, Nov 21; Shutdown rates and exposures, Nov 21; Kyshtym accident, Nov 26; SG inspection, Nov 39; *See also* World Survey, Jun 26

**Spain:** Life extension, Feb 56; French imports, Oct 10; SWUs for US, Dec 2; *See also* World Survey, Jun 26

**Spent fuel:** Gorleben pilot plant, Feb 12; Disposal economic, Mar 10; Cask design, Aug 24; B & W container, Aug 25; General Atomic cask, Aug 26; Bohunice problems, Sep 28; Direct disposal in FRG, Sep 38; Siemens' storage rack, Sep 44; Nuclear Electric's options, Oct 11; Modular vault dry store, Oct 105; Fuel Master, Dec 20; *See also* Waste

**Stendal:** 1 construction progress, May 2

**Steam generators:** Utilities considering replacement, Jan 17 (correction, Jun 12); Ringhals 2, Jan 20, Jan 24, Jan 29; Dampierre 1, Jan 29, May 3, Jul 8, Oct 124; Laser sleeving, Jan 35; PIPES expert system, Jan 37; PROFIL-360, Jan 39; Millstone 2, Jan 41, Oct 16; EdF tackles denting, Feb 15; Doel 3, Feb 15; Summer sleeving, Feb 18; Palisades, Apr 19; Prairie Island instrumentation, Apr 24; Paluel, May 6; Detecting PWSCC, May 46; Looking for leaks with helium, May 57; Remote tube inspection, May 57; Hot spinning head, Jul 3; Electropolishing in France, Aug 31; KWU chemical cleaning, Aug 33; Beznau, Nov 6; Soviet inspection, Nov 39

**Summer:** SG sleeving, Feb 18

**Superphénix:** *See* Creys Malville

**Susquehanna:** 1 alert, Mar 3

**Sweden:** Phase out, Feb 7, Jun 14, Nov 2, Nov 12; Units uprated, Jun 10; Accident avoidance, Jun 46; Waste encapsulation, Sep 45; Datafile, Oct 131; BWR cracks, Dec 7; *See also* World Survey, Jun 26

**Switzerland:** Moratorium, Nov 2; *See also* World Survey, Jun 26

## T

**Taiwan:** Availability, Mar 50; Future markets and technologies, Oct 41; *See also* World Survey, Jun 27

**Temelin:** 1 and 2 progress, Feb 7

**Three Mile Island:** 2, defuelling, Mar 3, cracks, Apr 4, medical records, Jul 6; 1 Licence extension, Jun 12

**THTR 300:** Decommissioning, Aug 10

**Tihange:** 1, cooling tower, Feb 12, fire protection, Apr 32; 2, power increase, May 58, SG cleaning, Sep 49

**Tomari:** 2 grid connection, Oct 20

**Transport:** Spent fuel cask design, Aug 24

**Trillo:** Fuel contract, Nov 13

**Trojan:** Shutdown rejected, Dec 3

**Turkey:** CAREM, Dec 8; *See also* World Survey, Jun 28

**Turkey Point:** 2 and 3 upgrade, Jan 4, Feb 4

## U

**Uljin:** 3 and 4 start, Oct 2

**United Kingdom:** Nuclear Electric/Scottish Nuclear take over, Jan 10, Feb 18; Will Britain ever learn? Jan 11; Lord Marshall on what went wrong, Jan 16a; Dose rates, Mar 10; NRPB, radon, Mar 10, accidental release, Mar 6; Supply obligation, Mar 11; Mobile supercompaction, Mar 47, May 6; Novel Absorber Evaluation Club, Mar 57; Fossil fuel levy, May 6; Job cuts, Jul 8; EFR withdrawal, Sep 6; Privatization, Sep 7; New decommissioning approach, Sep 25, Oct 10; Back-end options, Oct 11; ALWR agreement with EdF, Oct 12; Nuclear Electric changes, Nov 8; Labour plans, Nov 8; Datafile, Dec 48; *See also* World Survey, Jun 27

**United States:** EPA rules exemption, Jan 4, Jun 13; BNFL subsidiary, Jan 11; Radiation risk level raised, Feb 4; China sanctions, Feb 7; CYBER, Feb 10, Oct 4; Philadelphia Electric reborn, Feb 24; ALARA monitored, Feb 41; Licence renewal, Feb 54, Mar 3, Sep 3; Nebraska waste site, Mar 3, Sep 3; MHTGR study, Mar 3; O&M costs, Mar 3, Nov 35; Power shortages, Mar 4; UCS support, May 10; Decommissioning, May 10; Clean Air Act, May 11; Strike, May 11; Individual plant examinations, Jun 37; Utilities' security training, Jun 52; ALWRs, cheaper, Jul 6; Westinghouse MoUs, Oct 16; Global warming bill, Jul 7; Fuel fabrication, Aug 19; Waste repository rules, Aug 2; Nuclear R & D, Sep 10; Fusion facility, Oct 4; Reactor performance, Oct 12; Cancer, payments, Oct 12, no rise, Nov 7; Procurement practices, Oct 16; LLW, Oct 16; Simulation venture with USSR, Oct 92; Robots benefit PSE&G, Oct 120; USSR waste agreement, Nov 10; Longer cycles, Dec 25; WPPSS, Dec 2; Soviet SWUs, Dec 2; Pakistan, Dec 4; TVA for nuclear, Dec 8; Nuclide emissions, Dec 8; *See also* World Survey, Jun 27; US Department of Energy and US Nuclear Regulatory Commission

**Upgrading and refurbishment:** Turkey Point 3 and 4, Jan 4; US licence renewal, Feb 54, Mar 3, Sep 3; Spanish reference plants, Feb 56; Pilgrim, Feb 58; MAPPS, Feb 60; Beznau I & C, Apr 28; AGR monitoring and control, Apr 29; Valve life extension, Apr 44; Doel 3 and Tihange 2, May 58; French PWR vibration wear, Jul 28; Atucha 1, Jul 31; Paks, Jul 36; Kansai, Jul 40

**Uranium:** Kenya, Jan 4; Iran processing plant, Mar 3; Pakistan, Mar 10; Soviet/Korea order, Aug 4; Rabbit Lake, Dec 11

**US Department of Energy:** Yucca Mountain, Jan 3, Nov 10, Dec 3; New technologies, Jan 4; Young, Jan 4; Defence clean up, Jan 11; Siting test, Feb 7; R & d budget, Mar 4, Dec 8; Enrichment, budget, Mar 4, AVLIS, Apr 4, losses, Jun 13, government company, Jul 6; Soviet discussions, Jul 7; FFTF closure, Mar 4, May



10, Dec 8; USSR safety, May 6; Hanford, vitrification, Mar 40, Sep 47, waste tanks, Oct 16; Advanced reactors, May 10; MRS, May 10; Energy strategy, May 12; Early site permit, Jun 12; SBWR agreement, Jun 14; TMI medical records, Jul 6; Soviet PWR embrittlement, Jul 33 (correction, Aug 6); TRW waste contract, Aug 7; WIPP, go-ahead, Aug 7, test Dec 8; Shippingport decommissioning, Sep 20; Waste Management '90, Sep 42; Defence reactors, Oct 17

**US Nuclear Regulatory Commission:** Remick, Jan 4; Standardization, Feb 4; Maintenance rule, Feb 4; PRISM, Feb 4; DoE siting test, Feb 7; Licence renewal, Feb 54, Mar 3, Sep 3; Vogtle, May 10, Aug 6; Bayne, Jun 12; Training standards, Jun 12, Jul 6; Individual plant examinations, Jun 37; Certification of advanced designs, Aug 17, Oct 16, Nov 6; Generic EIS, Oct 16; NOMIS review, Oct 111; Yankee Rowe, Nov 7; O&M costs, Nov 35; Licensing rule, Dec 3; Enrichment licensing, Dec 3; Funding, Dec 8

**Uruguay:** Reactor plans, Apr 10; *See also* World Survey, Jun 28

## V

**Valves:** MOV maintenance, Apr 40; Calvert Cliffs service, Apr 41; Diagnostic equipment contracts, Apr 41; Performance system (Bechtel-KWU alliance), Apr 42; Testing (Wyle), Apr 42; Non-code and longer life (Valcor), Apr 43; *See also* Business

**Vandellos:** Fire report, Jun 11; No repair, Jul 4

**Vietnam:** India, Jul 7

**Vitrification:** West Valley, Mar 39; Hanford plant (wallchart), Mar 40, in-situ, Sep 47; Sellafeld, Mar 43; Soviet Union, Mar 48

**Vogtle:** Blackout, May 10, Aug 6

## W

**Wallcharts:** Hanford vitrification plant, March; CANDU 3, May; Modular vault dry store, Oct 105

**Waste:** Yucca Mountain, Jan 3, Nov 10, Dec 3; BNFL US subsidiary, Jan 11; Drigg charges, Feb 16; Crossflow microfiltration, Feb 50; Nebraska site, Mar 3, Sep 3; UK mobile supercompaction, Mar 47; Soviet Union, Mar 48; Japan, May 6; MRS, May 10; BRC disposal, Aug 6; TRW contract, Aug 6; WIPP, go-ahead, Aug 7, test, Dec 8; Nirex site drilling, Aug 10; US needs flexible rules, Sept 2; Handling in GDR, Sep 40; Waste Management '90, Sep 42; Encapsulation in Sweden, Sep 45; IAEA dumping code, Oct 6; US LLW, Oct 16; US/USSR agreement, Nov 10; *See also* Spent fuel and Vitrification

**Water chemistry:** Optimum pH, Aug 28; Electropolishing French SGs, Aug 31; Chemical cleaning of SGs, Aug 33; Secondary side monitoring, Aug 35

**Westinghouse:** Vantage 5, Mar 36; Hanford vitrification (wallchart), Mar 40; Prairie Island SG instrumentation, Apr 24; VITALS for MOVs, Apr 40; NPP offer, May 10; SIMON, May 34; Simulator instructor, Jul 46; TREAT, Jul 50; ABB co-operation ends, Aug 12; Palisades, Sep 2; AP600 safety, Sep 4; Fort St Vrain, Oct 16; ALWR MoUs, Oct 16; Future markets and technologies, Oct 54

**WNP:** 1 and 2 construction restart? Jul 6; 2 GE suit, Sep 10

**Wolsung:** 2 PHWR plan, Feb 17

**World Energy Council:** Nuclear and greenhouse effect, Nov 17

**World Association of Nuclear Operators (WANO):** Lord Marshall interview, Oct 28

**World Survey,** Jun 20 (correction, Jul 10)

**Würgassen:** Start refused, Feb 12

## X, Y, Z

**Yankee Rowe:** Pressure vessel, Nov 7

**Yeonggwang:** 3 and 4 construction permits, Feb 17

**Yugoslavia:** Plans, Oct 90

**Zaporozhe:** Halted, Oct 4

**Zarnowiec:** Halted, Mar 10, Nov 3

## AUTHORS

**Aalto E (Kukkola T and Mayer E)** Finns plan to take Loviisa main components out intact, Sep 33

**Abel E (Watson CJH)** A NEATER advance in active handling technology, May 26; **(Dumbreck AA)** 3D TV—looking forward in depth, Nov 44

**Adamov EO** The Soviet RBMK: where do we go from here?, Jun 33

**Akiyama, H** *See* Kawakami S

**Antonopoulos PT** Installing torus venting at the Pilgrim Mark 1 BWR, Feb 58

**Armitage G** Doses come down at Ontario Hydro, Nov 50

**Bacher P (Reynes L and Serviere G)** Towards a European PWR: EdF launches the REP 2000 project, Oct 58

**Bacot J (Guinot M and Tassera J-J)** Opting for a 2-cut scenario at Dampierre 1, Jan 29

**Balakrishnan MR** Finding a solution to moderator leakage at Madras, Feb 60

**Bairiot H (Vanden Bemden E)** MOX fuel delivers the goods, Mar 28

**Barker K** Lets talk, Nov 11; Investing in MOX for the future, Dec 30

**Banck J (Wasinger K)** 15 years of Siemens' high-density storage rack, Sep 44

**Batt T** *See* Bogard T

**Baum JW** *See* Khan TA

**Bayer A (Dehos R Kaul A Wehner G von Gadow A and Bühling A)** Integrating country-wide radiation surveillance in FRG, Feb 47

**Benner J (Till W)** Sensory-guided CATROB speeds up remote maintenance, May 38

**Beuneche D** Cutting down fuel maintenance times, Aug 21

**Bogard T (Batt T Roarty D and Hruby R)** Managing large amounts of erosion-corrosion NDE data with CEMS, May 50

**Bouchoux A** Putting Fuel Master rod consolidation to the test, Dec 20

**Bühling A** *See* Bayer A

**Brewer SJ** *See* Satyan-Sharma TR

**Bridestine DE** *See* Neeley GR

**Broadley D** The European fast reactor design takes shape, Aug 40

**Brognez J** *See* Harvard P

**Bruyere M** *See* Hillegeer M

**Burholt GD** Reviewing occupational exposure trends at PWRs, Oct 95

**Burge R** Will nuclear thrive in the greenhouse atmosphere? Nov 17

**Caussin P** *See* Dombret P

**Cave L** Making progress with Individual Plant Examinations in the US, Jun 37; Station blackout and public confidence: a cautionary tale, Jun 41

**Chapman TL** GE's new inspection system gives inside information on BWR RPV welds, Dec 41

**Chapin DL (Secker JR)** Tailoring Vantage 5 to suit each operator's needs, Mar 36

**Chapman RL** *See* Kouts J

**Chaumont J-C** *See* Dorimini G

**Cauquelin, C** Dealing with vibration wear in French PWR internals, Jul 28

**Colthorpe RA** NOMIS concludes US maintenance rule may not be necessary, Oct 111

**Cruikshank A** Longer cycles: verdict still awaited, Dec 25

**Davis GA (Kennedy EH)** System 80 Plus™ PWR aims for design certification, Oct 63

**Degreve D** *See* Dobbeni D

**Dehos R** *See* Bayer A

**Desaedeleer G (Paternoster Y and Hancart V)** TREAT Nuclear Plant Analyser aids engineering and training, Jul 50

**Dionne BJ** *See* Khan TA

**Dobbeni D (Degreve D)** Adapting ultrasonics to examine PWSCC in SGs; Using eddy currents to

examine PWR control rod wear, May 48

**Dodelier J (Quinaux JP)** Framagma upgrades the AFA, Mar 31

**Dombret P (Caussin P and Rorive P)** Developing ultrasonics for PWR pump bowl in-service inspection, May 42

**Dorimini G (Chaumont J-C)** Replacing the Dampierre 1 steam generators: a first in France, Oct 124

**Dumbreck AA** *See* Abel E

**Edelmann X (Gribi M)** Mechanized wall thickness inspection measures up to its cost, May 54

**Ericson DM** PRA and the common-mode problem, Jun 38

**Estevan M-T** Is there a future for nuclear power in Spain? Oct 24

**Etzel WK (Golan S et al)** Assessing the feasibility of the modular HTGR, Oct 60

**Fincher CE (Price MST and Rickard RK)** UK finds supercompaction promising, Mar 47

**Forbes CA** Upgrade, rebuild or replace? Jul 43

**Foyle R** Hot particles: the hidden enemy? Apr 46

**Flanagan S** *See* Pullen R

**Fraile AR** *See* Rendon JG

**Franzen FL** Taking another look at the IAEA's OSART programme, May 18

**Fujita K** *See* Kawakami S

**Gilroy KS** Nuclear Electric gains new insights into the problem of cast austenitics, May 44

**Glass SW (Griffith JC)** PROFIL-360 inspection tool takes the rough with the smooth, Jan 39

**Golan S** *See* Etzel WK

**Gorza E** Ten year review brings better fire provisions to Tihange 1, Apr 32

**Greenhalgh G** Focus shifts to organizational issues, Mar 20

**Gribi M** *See* Edelmann X

**Griffith JC** *See* Glass SW

**Guillo B** Gibbon gets to grips with Soviet steam generator inspection, Nov 39

**Guinot M** *See* Bacot J

**Gutman RG (Cook N)** Stainless steel for crossflow microfiltration, Feb 50

**Hakata T** Japanese reduce scram rate for PWRs, Oct 102

**Hampson D** *See* Turner A

**Hancart V** *See* Desaedeleer Y

**Hargitai T** Reconstructing and upgrading the Hungarian VVR-SM, Dec 44

**Havard P (Brognez J Roofthoof R Odar S and Roumiguere F)** KWU's two-step SG chemical cleaning works well at Tihange, Sep 49

**Hayashi K** *See* Neeley GR

**Hedges KR (Hinchley EM)** CANDU 3 aims to provide a smaller, cheaper, more reliable alternative, May 22

**Helmes M** *See* Speranzini R

**Hendrixson ES** The importance of tramp uranium in pressurized water reactors, Nov 48

**Henry KH** *See* Kouts J

**Heuser FW (Werner WF)** Final version of German Phase B, Mar 17

**Hevia F** Spain investigates PLEX options, Feb 56

**Hill JO (Paris RE)** Upgrading SG level control instrumentation at Prairie Island, Apr 24

**Hillegeer M (Bruyere M)** Increasing power painlessly at Doel 3 and Tihange 2, May 58

**Hinchley EM** *See* Hedges KR

**Holt AJ** A modular vault dry storage facility for Fort St Vrain, Oct 105

**Howles L** Nuclear station achievement, Feb 21, Apr 12 (correction Jun 11), Sep 17

**Hruby R** *See* Bogard T

**Ichikawa T** *See* Kawakami S

**Jacobson D** *See* Reisch F

**Jayawardene N (Naqvi S)** Ontario Hydro proposes canning and burying CANDU reactors, Sep 22

**Jend R** Safety first at Siemens' new Hanau MOX fuel plant, Dec 33

**Jones G** Magnetic bearings promise reduced operation and maintenance costs

**Joos DW** Palisades opts for SG replacement this



autumn, Apr 19

**Judd AM** Design drives R & D, Aug 43

**Kajii Y** Kansai looks to laser sleeving, Jan 35

**Karger J** The benefits of openness at Cernavoda, Jun 18

**Kaul A** See Bayer A

**Kawakami S** (Akiyama H Shibata H Watabe M Ichikawa T and Fujita K) Control rod behaviour in earthquakes, Apr 26

**Keil E** See Weichmann K

**Kendall GM** Maintaining dose histories in the UK, Nov 53

**Kennedy EH** See Davis GA

**Kessler WE** See Etzel WK

**Khan TA** (Dionne BJ Zheng H and Baum JW) Brookhaven monitors ALARA efforts in the United States, Feb 41

**Kirchoff M** PG&E upgrades radiation monitoring, Nov 52

**Knox RA** Analysing load factors by vendor, Jul 20

**Koppe R** See Olson E

**Koryakin Y** The Soviet Union prepares to roll up its sleeves, Nov 21

**Kouts CA** Innovative designs greatly increase capacity of spent fuel casks, Aug 24

**Kovan D** AEA Technology: the birth of a nuclear institution? Jan 14

**Krcek V** (Leicman J) Developing and upgrading full-scope systems in Czechoslovakia, Jul 48

**Kucerka M** (Leicman J) Getting on with dismantling at Czechoslovakia's Bohunice, Sep 28

**Kuhnke K** See Odar S

**Kukkola T** See Aalto E

**Lake WH** See Kouts J

**Lebastard G** Building Melox to meet future demand, Dec 32

**Lebreton F** See Ruess F

**Lee SP** CANDU 3 incorporates new concepts, Apr 31

**Leicman J** See Krcek V and Kucerka J

**Lin E** Improving availability at baseload plants in Taiwan, Mar 50

**Looft H** Starting up again, Jan 29

**Manninen T** Computers replaced at Finland's Loviisa PWR — on-line and on time, Jul 23

**Lomasney HL** Strippable coatings help reactor cavity decon, Sep 55

**Lorenzen J** FRPS simulates fuel rod behaviour, Aug 22

**McNulty T** Inspecting Sizewell B Class 1 and 10F components, Dec 42

**Masters RF** Will Britain ever learn? Jan 11; World Survey - New emphasis on safety, Jun 20

**Matmura H** See Mori M

**Matthews MS** Picking up the vibrations for life extension, Apr 44

**Mayer E** See Aalto E

**Mears LD** See Etzel WK

**Medvedev Z** Bringing the skeleton out of the closet, Nov 26

**Merilo M** ACE puts containment venting systems to the test, Feb 49

**Moinaud C** Tackling corrosion in shrunk-on disc turbine rotors at French PWRs, Aug 37

**Mori M** (Matmura H) Kansai takes a predictive approach to degradation problems, Jul 40

**Nagarajan V** USSR and USA get together in simulation joint venture, Oct 92

**Naqvi S** See Jayawardene N

**Neddenheim K** Employee attitudes the key to exposure reduction, Nov 46

**Neeley GR** (Bridenstine DE Yoshinaga T and Hayashi K) On-screen design makes updating easy at Japanese BWR project, Jul 53

**Neuschaefer CH** (Rzasa P) PIPES expert system speeds up eddy-current inspection planning, Jan 37

**Noel J** Getting ahead on tactical response training at American utilities, Jun 52

**Norton D** (Watkinson B) Replacing a dissolver cell at Sellafield

**Odar S** (Kuhnke K and Riess R) Solving SG corrosion problems with the KWU chemical cleaning technique, Aug 33; See also Havard P

**Olson E** (Koppe R and Waage J) Rationalizing regulation could help cut US O&M costs, Nov 35

**Owen D** Protective clothing and hot particle control: EPRI workshop gives the issues an airing, Feb 38

**Paris RE** See Hill JO

**Paternoster, Y** See Desaedeleer, G

**Pullen R** (Flanagan S) IsoVu helps builds up diagrammatic representations, Nov 54

**Quinn, PP** Opportunity knocks for enrichment suppliers, Jun 29

**Quinaux J-P** See Dodelier J

**Raimondo E** Automated reactor protection testing saves time and avoids errors, Apr 21

**Raudenbush MH** Waste Management '90 focus shifts to defence waste, Sep 42

**Reason J** The age of the organizational accident, Jul 18

**Reisch F** Lessons from Greifswald incidents, Jun 42; (Jacobson D) Striving for accident avoidance at Swedish plants, Jun 46

**Rendon JG** (Fraile AR) DATYS integrates piping and supports engineering, Jul 57

**Reynes L** See Bacher B

**Richardson DL** (Clark JP Dykes ER and Terhune JH) Inspecting BWR in-core housings from the refuelling bridge, Nov 42

**Riess R** See Odar S

**Roarty D** See Bogard T

**Roofthoof R** See Harvard P

**Rorive P** See Dombret P

**Roumiguere F** See Harvard P

**Ruess F** (Lebreton G) NPI one year on, Oct 56

**Rydell R** A premature demise for RERT?, Dec 43

**Rzasa P** See Neuschaefer CH

**Sanderson A** (Werme L) Electron beam welding resolves encapsulation dilemma in Sweden, Sep 45

**Sapyta JJ** See Tucker JS

**Satyan-Sharma TR** (Brewer SJ) Seismically qualified scaffolding improves safety and shortens outages, Oct 121

**Saunders LJ** When not if — the case for the EFR, Aug 39

**Schawartz MH** Competition still fierce in the US fabrication market, Aug 19

**Scowen PA** Sintered metal HEPA systems make progress, Feb 52

**Secker JR** See Chapin DL

**Serviere G** See Bacher P

**Shibata H** See Kawakami S

**Simon WA** See Etzel WK

**Simpson J** NPT review ends without final document, Dec 16

**Smale ND** Experience confirms the value of metal fibre filters, Mar 55

**Smart, I** Preparing to review the NPT, Aug 16

**Smith RA** (Nyman DH and Anderson BN) Getting ready to build the Hanford Waste Vitrification Plant, Mar 40

**Speranzini RA** (Voit R and Helms M) CAN-DECON makes a strong comeback as CAN-DEREM, Sep 52

**Spielgelberg R** PRIS analyses world trends, Oct 99

**Spitalnik J** The Latin American experience, Oct 108

**Stadie KB** LOFT results show how international co-operation brings imaginative and effective solutions, Oct 127

**Strong JS** Helping the instructor instruct, Jul 46

**Steyn JJ** Transition period expected for the uranium market, Aug 18

**Tassera J-J** See Bacot J

**Till W** See Benner J

**Thomas S** Small PWRs do well in the Eastern Bloc, Nov 23

**Trampus P** Paks surveillance shows reactor vessels safe from embrittlement, Jul 36 (correction, Aug 6)

**Tucker JS** (Sapyta JJ) Using FARIS for assembly clean-up and debris removal, May 60

**Turner A** Remote repair of Dungeness A and Oldbury thermocouple pockets, Oct 116

**Vanden Bemden E** See Bairot H

**Vanecek CW** See Weber PJ

**Varley J** Keeping up the good work on dose reduction, Feb 17; How well is your organization? Mar 12; Lessons from an insider's notebook, Jun 50; Farewell V-230, Jul 10; East German nuclear power faces an uncertain future, Jul 12; Handling low and medium active waste in East Germany, Sep 40; Four years on, Oct 24; WANO gets off to a good start, Oct 28; Soviet industry fights for survival, Oct 70

**Vincent F** Gaining good experience with MOX at

French PWRs, Dec 35

**Voit R** See Speranzini RA

**von Gadow A** See Bayer A

**Waage J** See Olson E

**Wasinger K** See Banck J

**Watabe M** See Kawakami S

**Watkinson B** (Norton D) Replacing a dissolver cell at Sellafield

**Watson CJH** See Abel E

**Weber PJ** (Vanecek CW) SIMON combines radiation hardness with computer power, May 34

**Weeks, JR** Radiation embrittlement and the annealing of Soviet PWR vessels, Jul 33 (correction, Aug 6)

**Weissman B** Doubling the life of condensate filters, Feb 52

**Werme L** See Sanderson A

**Werner G** See Bayer A

**Werner WF** See Heuser

**Wiechmann K** (Keil E) Meeting the 72-day deadline: the contractor's perspective, Jan 24

**Wikdahl, C-E** Swedish nuclear power: to phase out or not to phase out? Nov 12

**Wistrom J-D** See Etzel WK

**Wood C** How the water-chemistry revolution is reducing exposure, Feb 27; Approaching a consensus on the optimum pH for PWRs, Aug 28

**Wood J** Cost lessons learnt from decommissioning Shippingport, Sep 20; Comecon links begin to unravel, Oct 83

**Yoshinaga T** See Neeley GR

**Yokota M** (Ishikawa H) Underwater arc saw gets to work on the vessel at Japan's JPDR, Sep 35

**Zheng H** See Khan TA

## BOOKS

**1990 year book of nuclear medicine**, The ed PB Hoffer, Dec 47

**ASME handbook on water technology for thermal power systems** ed P Cohen, Sep 58

**Concrete radiation shielding** by F Kaplan, Sep 58

**Dictionary and handbook of nuclear medicine and clinical imaging** by MP Iturralde, Dec 47

**New heat transfer** by EF Adiatori, Sep 58

**Nuclear energy in perspective**, Sep 58

**Nuclear measurements in industry** by S Rózsa, Sep 58

**Nuclear strategies in food and agriculture - 25 years of progress**, Sep 58

**Optimal control of distributed nuclear reactors** by GS Christensen *et al*, Dec 47

**Power station simulators** by D Zanobetti, Sep 58

**Thermoluminescence in solids and its application** by K Mahesh *et al*, Sep 58

**Understanding radioactive waste** by RL Murray, Sep 58

## CONFERENCE PROCEEDINGS

**11th advances in reliability technology symposium**, Liverpool University, Dec 47

**Acceptance of, control of and trade in irradiated food**, IAEA, Nov 14

**Antiproton-nucleon and antiproton-nucleus interactions**, Ettore Majorana Centre, Dec 47

**Applications of accelerators**, Fermilab, Dec 47

**Advanced water-cooled reactor technologies**, OECD, Nov 14

**Artificial intelligence and other innovative computer applications in the nuclear industry**, ANS, Nov 14

**Assuring structural integrity of steel reactor pressure boundary components**, post SMIRT, Nov 14

**Decommissioning and demolition**, UMIST, Dec 47

**Decommissioning of nuclear installations**, CEC, Dec 47

**Design codes and structural mechanics**, post SMIRT, Nov 14



Emergency planning in case of nuclear accident, OECD, Nov 14  
 Emergency preparedness for nuclear powered satellites, OECD Dec 47  
 Fast neutron breeder fission reactor, The, Royal Soc, Dec 47  
 Fast reactor core and fuel structural behaviour, BNES, Dec 47  
 Feedack of operational safety experience from nuclear power plants, IAEA, Nov 14  
 Fission product transport processes in reactor accidents, International Centre for Heat and Mass Transfer, Nov 14  
 In-core instrumentation and reactor assessment, OECD, Nov 14  
 In-situ experiments associated with the disposal of radioactive waste, OECD, Dec 47  
 International Tokamak reactor, IAEA, Nov 14  
 Mathematical modeling and computer simulation of processes in energy systems, International Centre for Heat and Mass Transfer, Nov 14  
 New aspects of high-energy proton-proton collisions, Italian Istituto Nazionale di Fisica Nucleare, Nov 14  
 Noise and nonlinear phenomena in nuclear systems, NATO, Nov 14  
 Non-destructive examination in relation to structural integrity, post SMIRT, Nov 14  
 Nuclear contamination of water resources, ICE, Dec 47  
 Nuclear power station project management, BNES, Nov 14  
 Probabilistic safety assessment in nuclear power plant management, OECD, Nov 14  
 Radiation protection, Werner Burkart, OECD, Nov 14  
 Radiation protection — theory and practice, Institute of Physics, Nov 14  
 Radioactive waste management, BNES, Nov 14  
 Recovery operations in the event of a nuclear accident or radiological emergency, IAEA, Nov 14  
 Risks associated with human intrusion at radioactive waste disposal sites, OECD, Nov 14  
 Safety of the nuclear fuel cycle, Weinheim, Nov 14  
 Safety assessment of radioactive waste repositories, OECD, Nov 14  
 Sealing of radioactive waste repositories, OECD, Nov 14  
 Technology of turbine plant operation with wet steam, BNES, Nov 14  
 Thermal conductivity 20, International Thermal Conductivity Conference, Nov 14  
 Water chemistry of nuclear reactor systems 5, BNES, Dec 47

## LETTER

Gravity flooding, K Hannerz, Mar 12

## COMMENT

Will Britain ever learn?, Jan 11; Keeping up the good work on dose reduction, Feb 17; How well is your organization? Mar 12; Swedish energy policy still clouded, Jun 14; Farewell V-230, Jul 10; Who profits

from decommissioning THTR-300, Aug 11; Four years on, Oct 24; Is there a future for nuclear power in Spain? Oct 24; Let's talk, Nov 11

## BUSINESS TO BUSINESS

**Acquisitions:** Feb 18 (Pacific Nuclear Systems, Edlow International, Conam Nuclear, EG&G)  
**Agreements:** (AEA Technology Intec/EG&G Instruments, Sonomatic/Kawaski Steel Techno-Research Corporation, Glacier Metal)  
**Analysis:** Oct 34 (Ludlam Sysco, Staplex, Outokumpu Electronics)  
**Cabling:** Aug 12 (ISICAD (UK), Radiodetection)  
**Certification:** Feb 18 (Nuclear Assurance Corporation, Imaging and Sensing Technology)  
**Company news:** Jan 12 (B & W Nuclear Service Co, Pacific Nuclear Systems, Edlow International, Mitsubishi Heavy Industries, Zetec, Sfen, Commissariat à l'Energie Atomique, Tenet Systems); Feb 18 (Pacific Nuclear Systems, Nuclear Electric, Kroll Giant Cranes, GEC Alstom Engineering Systems); Mar 14 (James Williamson & Partners, Babcock & Wilcox, Interatom); Apr 11 (Baltimore Gas and Electric, SAC International, Detroit Edison); May 14 (Altone Flanges, Edlow International, EcoTech, Sonomatic, Hopkinsons); Jun 16 (General Energy Technologies, Compagnie Generale d'Electricité, Hopkinsons, Taylor Hitec); Aug 12 (FAG, Nuclear & General Engineering, SAC Hitec, Bechtel Artificial Intelligence Institute); Sep 14 (Reactor Experiments, Holtec International, Crosby Valve and Engineering, HIG, KEMA USA, Kansas Gas & Electric); Oct 32 (GEC Alstom Engineering, S3 Technologies, RWE, NNC); Nov 13 (Helgeson Scientific Services, Shlumberger Technologies, JGC Corporation, Eurosir, Imaging and Sensing Technology Corporation); Dec 14 (Victoreen, Urangessellschaft Canada, SAC Technographic)  
**Contracts:** Jan 12 (NNC, Framatome, Protech Instruments); Feb 18 (B & W Nuclear Service Co, Odetics, Holtec International, Transnuclear, UE&C-Catalytic); Mar 15 (KWU Group of Siemens, MC Air Filtration, ABB Atom, Holtec International, Pacific Nuclear Systems, Grove Coles); Apr 11 (Permali Gloucester, ABB Atom); May 14 (Rotork Actuation, Pacific Nuclear Systems, Engineering Science, Sir Robert McAlpine & Sons, Fairey Microfiltrex); Jun 17 (Link-Miles Simulation, Pacific Nuclear Systems, ABB Reaktor); Jul 16 (Fluor Daniel, Stone & Webster Engineering, Rotork Instruments, ABB Reaktor, NEI International Combustion); Aug 12 (Pilgrim Moorside, The Ralph Parsons Company, Modern Security Systems, GEC Alstom Engineering Systems, Westinghouse, Pacific Nuclear Systems, Brian+Luebbe); Sep 14 (KWU Group of Siemens, GEC Alstom Engineering, Framatome, BW/IP International); Oct 34 (Victoreen, Turnbull Control Systems, NEI Control Systems, Peter Brotherhood, Yard); Nov 13 (Siemens, SD-Scicon UK); Dec 14 (Furse Specialist Contracting, AEA Technology, Rossing Uranium Mining, NEI Control Systems, Pacific Nuclear Systems)  
**Cooling towers:** Aug 12 (LTH Electronics, Rotronic Instruments)  
**Corrosion:** Dec 14 (Cormon, Sulzer, Wells Krautkramer)  
**Decontamination:** Oct 32 (Quadrex Corporation, Enpac,

Gregomatic Sales)  
**Dosimetry:** Jul 16 (Mini Instruments, Computype)  
**Eastern Europe:** Jul 16 (BITT Technology, Westinghouse Energy Systems)  
**Filters:** Oct 33 (Vokes, Fairey Microfiltrex); Nov 13 (Vokes)  
**Flowmeters:** Sep 14 (Fluid Components, Kurz, MKS Instruments)  
**Fuel/Control rods:** Jun 16 (KWU Group of Siemens, Studsvik Nuclear, ABB Atom)  
**Materials:** Feb 18 (ICI Chemicals and Polymers, ERTA, Boston Chemical Co)  
**Monitoring:** Oct 32 (Victoreen, EG & G Instruments)  
**Monitors:** Apr 11 (Reuter-Stokes, Harwell laboratory, Wallac); May 15 (Victoreen, Vinten Analytical)  
**NDT:** Jun 16 (Du Pont, Nuclear Supplies and Services); Oct 34 (Wells Krautkramer, Du Pont Imaging Systems, Bently Nevada); Nov 13 (Sonomatic, Bently Nevada, Du Pont NDT Systems); Dec 14 (National Vulcan, Omega Engineering, CML)  
**New products:** Jan 13 (Henke-Sass Wolfe, ECS Power Systems, K Controls, Wells Krautkramer, Ceramaseal, Southern Scientific, Huntingdon Fusion Techniques); Feb 18 (MSA International, Siemens, Victoreen); Mar 15 (Steele, Victoreen, Imaging and Sensing Technology); Oct 35 (Ahem, Gray-Campling, ABB Hafo, Vacuum Generators, Time and Precision, Senior United Flexible)  
**Outage services:** Jan 12 (Power Generation Group of Siemens, ABB/Voest, Westinghouse European Service Centre, B & W Nuclear Service Co); Sep 15 (Ellis Integral Valve Locks, Allwood, Searle & Tinney, Faircrest Industrial and Scientific Equipment, PBM, E H Wachs, Pall)  
**Outage work:** May 14 (Framatome Nuclear Services, B & W Nuclear Service Company)  
**Pipework:** Mar 14 (Tri Tool, Stubbs Welding, Huntingdon Fusion Techniques); May 14 (BTR Silvertown, E H Wachs, Huntingdon Fusion Techniques)  
**Robotics:** Mar 15 (Westinghouse, AEA Technology); Oct 32 (Heritage Controls, Remotec, Bilz)  
**Sizewell B:** Jul 16 (Air Conditioning, Rawlplug)  
**Software:** Jun 17 (Tenera); Jul 16 (EG&G Instruments); Aug 13 (Measurements Group, Grove Engineering); Oct 33 (Tenet Systems, Siemens)  
**Testing:** Jul 17 (FaAA Products Corporation, Wells Krautkramer)  
**Training:** Oct 35 (Power Safety International)  
**Valves:** Jan 12 (KWU Group of Siemens, Alexander Controls, Valcor Engineering Corp); Feb 18 (Alexander Controls, PBM, Varian); Mar 14 (James Walker, Valcor Engineering Corporation, Westinghouse Electric, B & W Nuclear Services Co); Jun 17 (Hopkinsons, Henz-Movats, Omega Engineering, Valcor Engineering); Dec 15 (Teldyne Engineering Services, Valtac, NEI Thompson)  
**Video:** Aug 13 (Henke-Sass Wolfe, Bowtech Products)  
**Water chemistry:** Sep 15 (LTH Electronics, Bran+Luebbe)  
**Waste:** May 15 (WasteChem, Stone and Webster, B & W Fuel Company); Jun 16 (KWU Group of Siemens, Dunlop Precision Rubber, Thompson Nuclear Engineering); Jul 17 (Pacific Nuclear Systems, WasteChem); Dec 15 (Argonne National Laboratory, Westinghouse Idaho Nuclear, Lynx Geosystems, Pacific Nuclear Systems)  
**Welding:** Apr 11 (Huntingdon Fusion Techniques, Stanelco); Oct 33 (Fabtech, Huntingdon Fusion Techniques, Stanelco, Wachs)

Reed Business Publishing Group Ltd  
 Quadrant House  
 The Quadrant  
 Sutton  
 Surrey  
 SM2 5AS  
 England



REED BUSINESS  
 PUBLISHING  
 GROUP